

CLAIMS

1. Multi-stage transmission of planetary structure, in particular for a motor vehicle, which comprises a drive input shaft and a drive output shaft arranged in a housing, three single-web planetary gearset assemblies (P2, P2, P3), at least six rotating shafts (0, 1, 2, 3, 4, 5, 6) and at least five shift elements (03, 04, 13, 16, 45) which consist of brakes and/or clutches, whose selective engagement two at a time produces various transmission ratios between the drive input and the drive output shafts so that six forward gears and one reverse gear can be engaged, characterized in that the drive input shaft (1) is connected directly to the solar gearwheel of the first planetary gearset (P1), the annular gearwheel of the first planetary gearset (P1) is in rotationally fixed connection with the housing, the drive output takes place via a shaft (2) which is connected to the annular gearwheel of the second planetary gearset (P2) and to the web of the third planetary gearset (P3), a shaft (3) is permanently connected to the web of the second planetary gearset (P2) and to the annular gearwheel of the third planetary gearset (P3), a shaft (4) is permanently connected to the solar gearwheel of the second planetary gearset (P2), a shaft (5) is permanently connected to the web of the first planetary gearset (P1), and a shaft (6) is permanently connected to the solar gearwheel of the third planetary gearset (P3), such that the shaft (3) can be coupled to the housing by a brake (03), the shaft (4) can be coupled to the housing by a brake (04), a clutch (13) connects the shafts (1) and (3) to or releases them from one another, a clutch (16) connects the shafts (1) and (6) to or releases them from one another, and a clutch (45) connects the shafts (4) and (5) to or releases them from one another.

2. Multi-stage transmission of planetary structure, in particular for a motor vehicle, which comprises a drive input shaft and a drive output shaft arranged in a housing, three single-web planetary gearset assemblies (P2, P2, P3), at least six rotating shafts (0, 1, 2, 3, 4, 5, 6) and at least five shift elements (03, 04, 13, 15, 16) which consist of brakes and/or clutches, whose selective engagement two at a time produces various transmission ratios between the drive input and the drive

output shafts so that six forward gears and one reverse gear can be engaged, characterized in that the drive input shaft (1) is connected via the clutch (15) to the solar gearwheel of the first planetary gearset (P1), the annular gearwheel of the first planetary gearset (P1) is in rotationally fixed connection with the housing, the drive output takes place via a shaft (2) which is connected to the annular gearwheel of the second planetary gearset (P2) and to the web of the third planetary gearset (P3), a shaft (3) is permanently connected to the web of the second planetary gearset (P2) and to the annular gearwheel of the third planetary gearset (P3), a shaft (4) is permanently connected to the solar gearwheel of the second planetary gearset (P2) and to the web of the first planetary gearset (P1), a shaft (5) is permanently connected to the solar gearwheel of the first planetary gearset (P1), and a shaft (6) is permanently connected to the solar gearwheel of the third planetary gearset (P3), such that the shaft (3) can be coupled to the housing by a brake (03), the shaft (4) can be coupled to the housing by a brake (04), a clutch (13) connects the shafts (1) and (3) to or releases them from one another, a clutch (16) connects the shafts (1) and (6) to or releases them from one another, and a clutch (15) connects the shafts (1) and (5) to or releases them from one another.

3. Multi-stage transmission of planetary structure, in particular for a motor vehicle, which comprises a drive input shaft and a drive output shaft arranged in a housing, three single-web planetary gearset assemblies (P2, P2, P3), at least six rotating shafts (0, 1, 2, 3, 4, 5, 6) and at least five shift elements (03, 04, 05, 13, 16) which consist of brakes and/or clutches, whose selective engagement two at a time produces various transmission ratios between the drive input and the drive output shafts so that six forward gears and one reverse gear can be engaged, characterized in that the drive input shaft (1) is directly connected to the solar gearwheel of the first planetary gearset (P1), the annular gearwheel of the first planetary gearset (P1) can be put in rotationally fixed connection with, or released from the housing by a brake (05), the drive output takes place via a shaft (2) which is connected to the annular gearwheel of the second planetary gearset (P2) and to the web of the third planetary gearset (P3), a shaft (3) is permanently connected

to the web of the second planetary gearset (P2) and to the annular gearwheel of the third planetary gearset (P3), a shaft (4) is permanently connected to the solar gearwheel of the second planetary gearset (P2) and to the web of the first planetary gearset (P1), a shaft (5) is permanently connected to the annular gearwheel of the first planetary gearset (P1), and a shaft (6) is permanently connected to the solar gearwheel of the third planetary gearset (P3), such that the shaft (3) can be coupled to the housing by a brake (03), the shaft (4) can be coupled to the housing by a brake (04), a clutch (13) connects the shafts (1) and (3) to or releases them from one another, a clutch (16) connects the shafts (1) and (6) to or releases them from one another, and the brake (05) connects the shaft (5) to or releases it from the housing.

4. Multi-stage transmission according to claims 1, 2 or 3, characterized in that the planetary gearsets (P1, P2, P3) are made as negative planetary gearset assemblies.

5. Multi-stage transmission according to claims 1, 2 or 4, characterized in that the fixed connection of the annular gearwheel of the first planetary gearset (P1) to the housing can be replaced by a releasable connection by means of a brake.

6. Multi-stage transmission according to claim 5, characterized in that an electric machine or another suitable additional drive machine can be arranged on the shaft (0) associated with the housing.

7. Multi-stage transmission according to any of the preceding claims, characterized in that freewheels can be inserted at any suitable point of the transmission.

8. Multi-stage transmission according to claim 7, characterized in that the freewheels can be inserted between the shafts (0, 1, 2, 3, 4, 5, 6) and the housing.

9. Multi-stage transmission according to any of the preceding claims, characterized in that the drive input and the drive output are provided on the same side of the housing.

10. Multi-stage transmission according to any of the preceding claims, characterized in that the drive input and drive output are provided on opposite sides of the housing.

11. Multi-stage transmission according to any of the preceding claims, characterized in that an axle differential and/or a transfer differential is arranged on the drive input side or on the drive output side of the housing.

12. Multi-stage transmission according to any of the preceding claims, characterized in that the drive input shaft (1) can be disengaged from a drive engine by a coupling element.

13. Multi-stage transmission according to claim 12, characterized in that as the coupling element, a hydrodynamic converter, a hydraulic clutch, a dry starter clutch, a liquid starter clutch, a magnetic powder clutch or a centrifugal force clutch is provided.

14. Multi-stage transmission according to any of the preceding claims, characterized in that in the force-flow direction an external starting element is arranged after the housing, in particular according to Claim 13, such that the drive input shaft (1) is in fixed connection with the crankshaft of the drive engine.

15. Multi-stage transmission according to any of the preceding claims, characterized in that starting takes place by means of a shift element of the transmission, and the crankshaft of the engine is permanently connected to the drive input shaft (1).

16. Multi-stage transmission according to claim 15, characterized in that the brake (04), the brake (03) or the clutch (16) can be used as the shift element.

17. Multi-stage transmission according to any of the preceding claims, characterized in that a torsional oscillation damper can be arranged between the engine and the transmission.

18. Multi-stage transmission according to any of the preceding claims, characterized in that a wear-free brake can be arranged on any shaft.

19. Multi-stage transmission according to claim 18, characterized in that a wear-free brake can be arranged on the drive input shaft (1) or the drive output shaft (2).

20. Multi-stage transmission according to any of the preceding claims, characterized in that an auxiliary drive output can be arranged on any shaft to drive additional aggregates.

21. Multi-stage transmission according to claim 20, characterized in that the auxiliary drive output can be arranged on the drive input shaft (1) or on the drive output shaft (2).

22. Multi-stage transmission according to any of the preceding claims, characterized in that the shift elements are formed as change-under-load clutches or brakes.

23. Multi-stage transmission according to claim 22, characterized in that disk clutches, band brakes and/or conical clutches can be used.

24. Multi-stage transmission according to any of the preceding claims, characterized in that form-enclosing brakes and/or clutches are provided as shift elements.

25. Multi-stage transmission according to any of the preceding claims, characterized in that an electric machine can be connected to any shaft as a generator and/or as an additional drive machine.